REMARKS

The Examiner rejected Claims 1-4, and 6-16 under 35 U.S.C. 103(a) as being unpatentable over Jamneala, *et al* (hereafter "Jamneala")(6,804,807), in view of Piratelli-Filho, *et al* (hereafter "Piratelli-Filho") (Uncertainty Evaluation in small angle Calibration using ISO GUM Approach and Monte Carlo Method, June 2003). Applicant traverses the rejection.

The Examiner states that Jamneala teaches substantially all the limitations of Claim 1 but "does not clearly state the term measurement uncertainty". The Examiner looks to Piratelli-Filho for the missing terminology/teaching. The Examiner maintains that it would have been obvious to combine the Monte Carlo uncertainty evaluation method of Piratelli-Filho with the method of Jamneala "because Piratelli-Filho teaches obtaining expanded uncertainly results which proved to simplify analysis (abstract)".

First, Applicant disagrees with the Examiner's reading of Jamneala. Claim 1 requires a model with a plurality of measurement uncertainties that are characterized by known probability distributions, since the remainder of the claim requires that values for these uncertainties be chosen randomly with respect to such distributions. There is no such uncertainty in any of the models taught in Jamneala. Jamneala teaches a model in which the values of the inductances in a model of a probe are determined by varying the inductances in the model until the model generates results that agree with the results obtained with a known probe. There is no teaching of a probability distribution describing the statistical variability of the inductance in questions, no less a teaching of determining a measurement uncertainty of a selected parameter.

Second, Applicant submits that there is no reasonable expectation of success in combining the teachings of Jamneala with those of Piratelli-Filho, and hence, the Examiner has not made a prima facia case for obviousness with respect to Claims 1 and the claims dependent therefrom.

The method of Piratelli-Filho requires that the uncertainty terms be described by known probability distributions. Absent such distributions, there is no way to choose parameters for the Monte Carlo simulation technique taught in Piratelli-Filho. As noted above, the "uncertainty terms" that the Examiner identifies in Jamneala are not described by such probability distributions. They are simply the unknown values of the corrections for self inductance and mutual inductance to be applied to the model of the GSG probe to take into account a **fixed imperfection** in the device under test. This fixed imperfection would cause the simulated measurements made by the GSG probe to be in error if the simulation correction method taught by Jamneala were not employed. The method of Jamneala determines the values of the self inductance and mutual inductance and hence eliminates these errors. Since the data needed to apply the teachings of Piratelli-Filho to the teaching of Jamneala is not present, there is no expectation of success in making the combination of the two teachings.

Accordingly, Applicant submits that the Examiner has failed to make a *prima facie* case for obviousness with respect to Claim 1 and the Claims dependent therefrom.

Claim 2 depends from Claim 1 and further requires that the simulator uses a harmonic balance simulation engine to produce the simulation results from the statistically selected uncertainty terms. The Examiner points to Jamneala col. 6, lines 7-17 and Piratelli-Filho section 2.2-3 for this additional teaching. Applicant submits that the cited passage in Jamneala merely refers to the use of an ADS simulator for generating a simulated model of a probe of the type taught in Jamneala being used with an exemplary circuit shown in Figure 2A of Jamneala. While an ADS includes a harmonic balance simulation engine, the ADS simulator also includes other simulation engines as well. Not all simulations made with the ADS simulator utilize the harmonic balance simulation engine. Applicant submits that the issue is not whether such a simulator is capable of carrying out a harmonic balance simulation, but whether the method taught by Jamneala is executed using that specific type of simulation. Applicant submits that the Examiner has not pointed to any such teaching in Jamneala or Piratelli-Filho that a harmonic simulation engine is utilized in the simulation. It should also be noted that Piratelli-Filho is directed to a method for determining measurement uncertainties in a mechanical system, and hence, a harmonic simulation engine is of no

relevance those teachings. Hence, Applicant submits that there are additional grounds for allowing Claim 2.

Claim 3 depends from Claim 1 and further requires that the simulator uses a time-domain simulation engine to produce the results. The Examiner points to Jamneala col. 6, lines 7-17 and Piratelli-Filho section 2.2-3 for this additional teaching. Applicant submits that the cited passage in Jamneala merely refers to the use of an ADS simulator. Applicant submits that the issue is not whether such a simulator is capable of carrying out a time domain simulation, but whether the method taught by Jamneala is disclosed as using that specific type of simulation. Applicant submits that the Examiner has not pointed to any such teaching in Jamneala or Piratelli-Filho. As noted above, Piratelli-Filho is directed to mechanical systems in which electrical simulation engines would have no relevance. Hence, Applicant submits that there are additional grounds for allowing Claim 3.

Claim 4 depends from Claim 1 and further requires that the simulator uses a linear S-parameter simulation engine to produce the results The Examiner points to Jamneala col. 6, lines 7-17 and Piratelli-Filho section 2.2-3 for this additional teaching. Applicant submits that the cited passage in Jamneala merely refers to the use of an ADS simulator. Applicant submits that the issue is not whether such a simulator is capable of carrying out a linear S-parameter simulation, but whether the method taught by Jamneala is disclosed as using that specific type of simulation. Applicant submits that the Examiner has not pointed to any such teaching in Jamneala or Piratelli-Filho. As noted above, Piratelli-Filho is directed to mechanical systems in which electrical simulation engines would have no relevance. Hence, Applicant submits that there are additional grounds for allowing Claim 4.

It should also be noted that the Examiner has pointed to the reference to an ADS simulator being used as evidence of three different simulation techniques being used for the same measurement when the reference is silent with respect to how the ADS was used. Since the simulation techniques are not used simultaneously, and Jamneala only gives one example of a simulation using ADS, the Examiner's position is inconsistent, and hence, is further evidence of the lack of teaching in the reference with respect to the type of simulation engine used in the example.

Claim 8 depends from Claim 1 and further requires that the test system model includes a device under test and the step of running the sufficient number of iterations to provide a first frequency to the device under test, and the results of the selected parameter are at a second frequency. The Examiner points to Jamneala, Fig. 1B-4, col. 1, lines 60-64 and col. 6, line 41 to col. 8, lines 23; also Piratelli-Filho pg. 1-4 for the missing teachings. Applicant submits that the cited figures and passages in Jamneala at best show that measurement simulations may be made over a range of frequencies. The Examiner has not pointed to any specific teachings in either of the cited prior art references that disclose that a first frequency is provided to the DUT while the results of the selected parameter are at a second frequency. As noted above, Piratelli-Filho is directed to mechanical systems in which electrical measurements at specific frequencies would have no relevance. Hence, Applicant submits that there are additional grounds for allowing Claim 8 and the Claims dependent therefrom.

Claim 9 depends from Claim 8 and further requires that the second frequency is a harmonic of the first frequency. The Examiner points to Jamneala Fig. 2B-4, col. 6, lines 41 – to col. 7, line 38; also Piratelli-Filho pg. 1- 4 for the missing teachings. As noted above with respect to Claim 8, Applicant submits that the cited figures and passages in Jamneala at best show that measurement simulations may be made over a range of frequencies that may be large enough to encompass multiple harmonics of a frequency of interest. The Examiner has not pointed to any specific teachings in either of the cited prior art references that disclose that the second frequency, i.e., the frequency at which the results are produced, is a harmonic of the first frequency provided to the DUT. As noted above, Piratelli-Filho is directed to mechanical systems in which electrical measurements at specific frequencies would have no relevance. Hence, Applicant submits that there are additional grounds for allowing Claim 9.

Claim 10 depends from Claim 8 and further requires that the second frequency is a mixing product of the first frequency and a third frequency. The Examiner points to Jamneala, Fig. 2B-4, col. 6, lines 41 to col. 7, line 38; Piratelli-Filho pg 1-4 for the missing teachings. As noted above with respect to Claim 8, Applicant submits that the cited figures and passages in Jamneala at best show that measurement simulations may be made over a range of frequencies that may be large enough to encompass multiple harmonics of a frequency of interest. The Examiner has not pointed to any specific teachings in either of the cited prior art

references that disclose that the second frequency, at which the results are provided, is a mixing product of the first frequency provided to the DUT, and a third frequency. As noted above, Piratelli-Filho is directed to mechanical systems in which electrical measurements at specific frequencies would have no relevance. Hence, Applicant submits that there are additional grounds for allowing Claim 10.

Claim 12 depends from Claim 1 and further requires that the test system model includes a test fixture comprising a plurality of switches and a plurality of cables. The Examiner points to Jamneala, Fig. 1, col. 1, lines 60-64, col. 3, line 50 to col. 4, line 6; Piratelli-Filho pg 1- 4 for the additional teaching. Applicant submits that there is no teaching in the cited Figures and passages in Jamneala of any switches or cables being included in the test system model. Applicant submits that the Examiner has not pointed to any specific teachings within the 4 pages of the Piratelli-Filho reference regarding this limitation. In fact, the teachings of Piratelli-Filho are directed to measurements of a mechanical system that lacks both switches and cables. Hence, Applicant submits that there are additional grounds for allowing Claim 12.

Claim 13 depends from Claim 1 and further requires that the step of running occurs at a first operating condition and further comprising steps of: running a sufficient number of iterations of the test system model on the simulator at a second operating condition while randomly varying each of the first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of second results of the selected parameter. The Examiner points to Jamneala Fig. 3B-5, col. 6, line 41- col. 8, line 23; Piratelli-Filho, pg. 1- 4 for this additional teaching. Claim13 also requires the evaluation of the second results to determine a second measurement uncertainty of the selected parameter. The Examiner points to Jamneala Fig. 2B-5, col. 6, lines 41 to col. 8, line 23; Piratelli-Filho, pg. 1- 4 for this additional teaching. Applicant submits that there are no uncertainty terms in the system taught by Jamneala, that no terms are randomly varied in the system taught by Jamneala, and that no measurement uncertainties are determined by evaluation of a set of "second results". With respect to the Examiner's citation of Piratelli-Filho, Applicant submits that it is the burden of the Examiner to point to specific teachings rather than to all four pages of the paper. The Examiner has not pointed to any specific passages within Piratelli-Filho that provide the missing teaching. Furthermore, Applicant can

find no such teaching in the reference. Finally, Applicant submits that Jamneala does a single set of simulations at one set of conditions to determine the uncertainties taught therein. Hence, Applicant submits that there are additional grounds for allowing Claim 13.

Claim 14 depends from Claim 1 and further requires that the step of running is done using a first type of simulation engine and further comprising steps of: running a second sufficient number of iterations of the test system model on the simulator using a second type of simulation engine while randomly varying each of the first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of second results of said second selected parameter. The Examiner points to Jamneala, Fig. 2B-5, col. 6, line 41 - col. 8, lines 23; Piratelli-Filho pg. 1- 4 for this additional teaching. Claim 14 also requires evaluating the second results to determine a second measurement uncertainty of the second selected parameter. The Examiner points to Jamneala Fig. 2B-5, col. 6, line 41 – col. 8, line 23; Piratelli-Filho pg. 1- 4 for this additional teaching. As noted above with respect to Claim 13, Applicant submits that there are no uncertainty terms in the system taught by Jamneala, that no terms are randomly varied in the system taught by Jamneala, and that no measurement uncertainties are determined by evaluation of a set of "second results". With respect to the Examiner's citation of Piratelli-Filho, no simulation engines are utilized in Piratelli-Filho. Hence, Applicant submits that there are additional grounds for allowing Claim 14.

Claim 15 depends from Claim 1 and further requires the step of developing a computer-readable library of test system components with uncertainty terms, and wherein the step of entering the test system model into the simulator includes loading uncertainty terms associated with the test system components from the computer-readable library. The Examiner points to col. 8, lines 35-45 of Jamneala for this additional teaching. Applicant submits that there is no teaching in the cited passage regarding the existence, let alone the loading of any uncertainty terms associated with the GSG probe. Hence, Applicant submits that there are additional grounds for allowing Claim 15.

Claim 16 depends from Claim 1 and further requires that the step of developing the test system model includes automatically generating system specifications. The Examiner points to Jamneala Fig. 5, col. 8, lines 12-23; Piratelli-Filho pg. 1- 4 for this additional

teaching. Applicant submits that the cited figure and passage in Jamneala refer to the comparison of measurements and simulations but do not disclose the automatic generation of system specifications. With respect to the Examiner's citation of Piratelli-Filho, Applicant submits that it is the burden of the Examiner to point to specific teachings rather than to all four pages of the paper. The Examiner has not pointed to any specific passages within Piratelli-Filho that provide the missing teaching. Hence, Applicant submits that there are additional grounds for allowing Claim 16.

The Examiner rejected Claim 5 under 35 U.S.C. 103(a) as being unpatentable over Jamneala in view of Piratelli-Filho and further in view of Helisto, et al (hereafter "Helisto") (Measurement Uncertainty in the 1/f noise region: Zener Voltage Standards, IEEE 2000). Applicant traverses the rejection.

The Examiner states that Jamneala as modified by Piratelli-Filho teaches the limitations of Claim 5 except for requiring that the plurality of uncertainty terms includes a noise term. The Examiner looks to Helisto for the missing teaching. The Examiner maintains that it would have been obvious to combine the uncertainty measurement method of Helisto with the method of Jamneala and the uncertainty evaluation method of Piratelli-Filho "because Helisto teaches a development that enable the measurements down to the fundamental noise limit of metrological devices (pg 402)."

First, as noted above with respect to Claim 1, from which Claim 5 depends, Applicant submits that Jamneala in view of Piratelli-Filho does not teach the limitations of the base claim, and there is no reasonable expectation of success in applying the method taught in Piratelli-Filho to the teachings of Jamneala. Helisto does not provide the missing motivation.

Second, Applicant submits that the motivation proposed by the Examiner for modifying the method taught by Jamneala according to the teachings of Helisto to satisfy the additional limitations of Claim 5 is flawed in two respects.

First, Applicant disagrees with the Examiner's reading of Helisto. Applicant submits that Helisto does not teach a development that enables measurements down to the

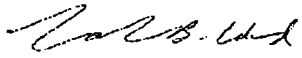
fundamental noise limit of metrological devices, as the Examiner states. Applicant submits that while Helisto states (page 102, first line of Conclusions) that "present day instrumentation" enables such measurements, Helisto is silent as to how that is achieved, and is concerned instead with characterizing what that noise limit is in various frequency ranges. Hence, Applicant submits that applying the teachings of Helisto to Jamneala would not provide the benefit suggested by the Examiner of enabling measurements down to the fundamental noise limit.

Second, as noted above with respect to Claim 1, Applicant submits that there are no measurement uncertainties in the system of interest to Jamneala. There would be a measurement error due to a fixed imperfection, but that error is avoided by using the iterative simulation taught by Jamneala to converge on best-fit values of self inductance and mutual inductance to put into the model. Helisto is simply concerned with the study and characterization of 1/f noise. The Examiner has not pointed to any suggestion that there is any source of 1/f noise in the test system of interest to Jamneala. Hence, Applicant submits that there would be no motivation to use any of the teachings of Helisto regarding 1/f noise in the system taught by Jamneala.

Accordingly, Applicant submits that the Examiner has failed to make a *prima facie* case for obviousness with respect to Claim 5.

I hereby certify that this paper is being sent by FAX to 571-273-8300.

Respectfully Submitted,



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